

GHRC UWG Report from the Onsite Meeting 7-8 October 2015 Huntsville, Alabama

Executive Summary

The GHRC updated its mission and objectives with the new focus on Hazardous Weather. The GHRC, in keeping with recommendations from the previous year, reviewed its current data holdings and possible additions, as well as its overall operations including data life cycle documents, and field campaign tools under development.

The UWG was extremely impressed by the progress the GHRC made since the initial review, especially with its vision for the role it plays in the NASA data services and distribution arena. The UWG understands that sometimes it is difficult to change the collective direction of an organization used to doing things “their way”, but praises the management team and GHRC staff for apparently embracing change and the excitement that comes with it.

Major recommendations include the acquisition of new data to support the new objectives, such as the land data from the upcoming SWOT mission, the creation of data bundles for scientists who want to study processes; and the development of a strategy for outreach, especially to communicate the new direction to the user community.

Four new members of the UWG are needed for next year’s meeting to replace retiring members. Some recommendations are made at the end of this report.

Meeting Report

A one and one half (1.5) day meeting was held to review progress towards meeting defined goals from the previous year’s UWG meeting. Fourteen (14) UWG members attended: Petersen, Markert, Molthan, Griffin, Beuchler, Gentemann, Blakeslee, Zawislak, Bang, Liu, Duncan, Kummerow, Bruning, and Wolff. There was broad representation from GHRC management, engineers, and scientists who participated throughout the 1.5 days, giving key presentations and leading discussions. NASA HQ was represented (Murphy) as well as a number of ESDIS personnel.

The first day consisted primarily of a set of presentations as had been previously agreed upon between the incoming chair of the UWG and the GHRC manager. These presentations focused both on progress related to the previous year’s recommendation plus new initiatives from the GHRC. The second day consisted of a closed-door session during which the UWG evaluated progress towards the recommendation as well as any new recommendations. A brief closed-door discussion was then held with the GHRC manager to understand any sensitivities that might be connected with recommendations before the preliminary findings of the UWG were shared with the entire GHRC staff.

The UWG acknowledges and appreciates the well-ordered and focused agenda. Without exception, the presentations were clearly organized, and the content, especially the reference to previous recommendations, was helpful to guide the review process. At the highest level, the UWG was extremely impressed by the progress the GHRC made since the initial review. Unlike

the first meeting, the GHRC this time had a clear vision of the role it is to play in the NASA data services and distribution arena. The UWG was fully supportive of this vision. The UWG further understands that sometimes it is difficult to change the collective direction of an organization, but praises the management team and GHRC staff for embracing change and the excitement that comes along with it.

In order to keep track of issues in an orderly manner, the document is organized into four parts. The first is related to general issues raised in the previous year. In this category, GHRC asked the UWG to review its web site in 2014. Because the site was not quite operational, this was addressed via a video conference with the UWG on March 18th to review the new web layout and functionality. GHRC received suggestions from the UWG at that time. The UWG was generally very supportive of the new design and functionality.

The second part of the report consists of a review of the previous year's recommendations along with four new recommendations from this year's meeting. We plan here to keep unique numbers for the recommendations, appending the year in which the recommendation was made (where necessary). They will remain active recommendations until the UWG closes them. New recommendations will be given incremental numbers (i.e. the first new recommendation of 2015 will be Recommendation #17 after 16 recommendations in 2014). The rationale for the old recommendations is not repeated as it can be found in the original justification. The third section of the UWG report comments on new data sets that may have been prioritized the previous year while the final section of the report deals with UWG structure and succession issues.

2a. Review of Previous Recommendations:

Recommendation 1: Evaluate and update the GHRC mission and objectives in coordination with the UWG members, NASA ESDIS, and Program Managers at NASA HQ.

A draft "Mission and Objective" statement was presented to the UWG. After some iterations among the UWG and GHRC management, the following statement was adopted: "The mission of the GHRC is to provide a comprehensive active archive of both data and knowledge augmentation services with a focus on hazardous weather, its governing dynamical and physical processes, and associated applications. Within this broad mandate, GHRC will focus on lightning, tropical cyclones, and storm-induced hazards through integrated collections of satellite, field experiment, and in-situ data sets". This statement effectively closes this recommendation as very similar text had been approved by NASA ESDIS and HQ prior to the meeting.

Recommendation 2: Develop a 5-10 year vision for GHRC and ensure the new website reflects that message.

A detailed strategic consideration of existing key data holdings, user metrics, and key science data foci relative to potential redundancies with other system DAACs and potential focus gaps was presented and discussed (also in the context of the developing mission statement). These considerations drove a proposed 5 – 10 year vision and developing mission statement broadly aligned with NASA weather and societal applications themes (e.g., hurricanes, lightning, precipitation, hazards, disasters), and continued growth and improvement of GHRC field campaign data archive system infrastructure and support. The approach to achieving the vision

included: 1) continued leveraging of NASA ROSES proposal mechanisms (ACCESS, AIST etc.) to further build GHRC capabilities; 2) improvements in operations efficiency; 3) development of an expanded data stewardship model built on improving accessibility, usability, preservation, and quality assurance of data; and 4) substantial expansion of GHRC field campaign information system infrastructure (e.g., HS3 model) to include provision of end to end support of field campaigns from the planning, implementation (e.g., operations portal) and data archive stages, and concluding with the development of new GHRC/user-based visualization and analysis tool suites to facilitate user science data analysis. This recommendation is now closed.

Recommendation 3: GHRC should hold AMS and AGU town halls, develop and distribute information brochures that describe their capabilities to potential data providers (e.g. field campaign PIs) and data users, utilize the NASA hyperwall, and pursue other opportunities (BAMS) to enhance GHRC visibility once the 5-10 year vision is developed and the web page reflects these objectives.

Outreach activity as suggested by the UWG has not yet occurred as the vision and mission statements have only recently been developed. It is thus left open but can be combined with new recommendation 18.

Recommendation 4: Carry out dataset holdings analysis and create a reporting structure that categorizes what is available at GHRC and possibly elsewhere. This compilation should enable prioritization of efforts that will fill the most significant data voids, where these efforts align with the new GHRC mission.

GHRC demonstrated Google Analytics tools that have been used to identify the data sets available by keyword. Other presentations provided some snapshots and references of the products available. They developed a strategy for skimming the community for possible new products to manage that are derived from NASA mission data, many directly related to atmospheric processes and hazards, though some of the hazards are arguably “induced” hazards caused as a result of atmospheric hazards (e.g. a landslide induced by heavy precipitation during a hurricane). The first part of the recommendation is therefore met.

Although there were several broad mentions of the types and numbers of data sets held, it would have been of greater benefit to see a listing of core data sets (satellite, field campaign, etc.) and a direct linkage (or not) to current and/or future mission focus areas. Previous UWG meetings identified that although they have holdings in passive microwave and various lightning data sets, criticism was levied that these are primarily the result of interests from MSFC-affiliated scientists. It is unclear what data sets would be collected and added from NASA missions and how they align with the current or future missions. The team accurately captured the opportunities available for upcoming field campaign data sets but also correctly acknowledged that these opportunities and continuity for these data sets are somewhat limited versus steady, global collections of satellite data holdings. The effort to fully understand their datasets, the connection to the GHRC goals, and the management of them going forward, was not yet met and more work is needed in this area.

Continued Work on Recommendation #4: It would be helpful to see their current and/or future mission broken into simple columns on a chart of some kind. This could include data holdings with a simple inventory of where they feel they have holdings that contribute strongly to their

mission areas, areas where they know that data sets are forthcoming (e.g. new field campaigns, GPM, etc.), and areas where they would need to “fill in” in order for them to provide meaningful services in these areas. This result should be used to guide a strategic plan and tactical plan that will seek out partnerships to fill in these data gap areas, either by proposing to host future mission data, or PI-led data sets, field campaigns, or some combination.

Recommendation 5: Update public dataset information pages to include data holding analysis results that might be helpful to the user community.

GHRC presented the Dashboard application, which tracks data holdings and presents a wide variety of statistics. If they move toward events-based data packaging, then they would want some sort of metric to measure the utility of this application. What was not addressed was the 'update public dataset information pages', and the UWG would like clarification on how the GHRC envisions the public using this tool and information. UWG recommends that this effort be continued and specifically (1) that the results from the data holding analysis be distilled into an annual report for the UWG and that the GHRC consider how often they will review these results - for example for data retirement review, (2) that there are links to the most cited publications per dataset on the landing pages, thus giving public users an understanding of dataset maturity, (3) that they be clear on who the users will be for this dashboard - internal or external, and (4) that statistics on international users be compiled. This recommendation therefore remains open.

Recommendation 6: Determine a set of useful user metrics, with feedback obtained from the UWG that can be routinely updated and made available to the NASA sponsor, UWG and broader community. Analysis of these metrics should inform the 5-10 year plan.

A number of statistics based on data usage were shown in the GHRC Data Holdings Dashboard. The Dashboard facilitates user exploration of GHRC data usage metrics. One drawback was that the Dashboard page was very busy. Perhaps a few plots summarizing the most important metrics could be displayed on the front page, with another link provided if one wants more specific information. For example, this link could be used to evaluate which datasets users download most often, to track dataset use over time, the effectiveness of publicizing dataset, and for evaluating when a dataset might be retired. Most of these ideas were presented or talked about during the GHRC presentation. Overall the GHRC has generated many metrics; but questions remain. For example, how many users fill out surveys on data usage? How many don't? There is still a need to determine which metrics are most important. The GHRC presented a list of things they still want to do with the metrics and they should continue pursuing these. Overall the GHRC addressed this issue well, and seem to have a solid plan going forward. The recommendation is nonetheless kept open until these final issues are resolved.

Recommendation 7: Review the "NOAA Procedure for Scientific Records Appraisal and Archive Approval" (https://www.ngdc.noaa.gov/wiki/images/0/0b/NOAA_Procedure_document_final.pdf) and the PODAAC Data lifecycle (http://podaac.jpl.nasa.gov/PO.DAAC_DataManagementPractices). Assess whether these procedures or a modified version of them are useful formalizations that would aid in creating a data lifecycle plan for existing and future GHRC data holdings.

The GHRC has examined the recommended documents and used them in developing a data lifecycle plan. This recommendation is closed.

Recommendation 8: Create a data lifecycle process for GHRC that can be applied to current and future holdings. Ask NSIDC and PODAAC for their policies and assess utility within GHRC. Publish the data lifecycle on the website, along with a contact, to provide clarity on the process for investigators interested in providing data.

The GHRC has created a data lifecycle plan that was provided in a document to the UWG prior to the meeting, and presented to the group during the meeting. The plan is comprehensive and covers the process for acquisition and implementation of new datasets and updated versions of current holdings, as well as the strategies for retiring datasets. It very clearly outlines the role within these processes for the data providers, dataset coordinator, documentation lead, and UWG. It is well described and just needs to be implemented for all new data. This part of the recommendation has been met. They have also identified priority levels (1-5) that can be assigned to potential datasets; NASA satellite, instrument, and airborne validation datasets have the highest priority, while commercial access datasets and other operational data (e.g., GOES imagery, NWS radar) are identified as lower priority. In addition, the GHRC has outlined levels of service that can be assigned to new datasets.

They have also developed an online questionnaire to be filled out by potential data providers. This questionnaire still needs further development, and would benefit from experimental use by UWG members and/or a few current/future data providers. One review is provided as Appendix A to this document. The questionnaire has the potential to satisfy their goals to semi-automate data ingestion, to minimize collection redundancy, and minimize required interactions with the provider. When complete, the questionnaire can be shared with other DAACS. The data lifecycle plan also has not yet been published on the website. The website does not yet have a clear location where a potential data provider can obtain information on the services the GHRC can provide, nor how to submit a request (the questionnaire) to archive their dataset. For these reasons, the recommendation remains open.

Recommendation 9: Assess what might be useful in the NODC netCDF data template and develop some guidelines or work flows for GHRC to handle future field campaign data.

The GHRC has created a comprehensive data lifecycle plan for new and existing reprocessed data. It is well described and just needs to be implemented for all new data. They have developed an online data questionnaire form that should be developed further and shared with other DAACS. This recommendation remains open.

Recommendation 10: Develop a data maturity model for GHRC data. Provide this on website and include maturity information for each dataset provided. Review NOAA's data maturity model (<http://www1.ncdc.noaa.gov/pub/data/sds/maturity-table-6level.pdf>) as a starting point.

GHRC has reviewed both NOAA and NASA data maturity models. No action has been taken in implementing a model to the datasets yet. UWG recommends that GHRC continue working on applying the NASA data maturity model to all the datasets, taking the advantage of the data usage statistics in the maturity assessment. This recommendation remains open.

Recommendation 11: Recommendation #: Determine LIS technical specifications for data products, latency, formats, etc. Publicize this future data source at appropriate venues.

This recommendation addresses the future importance of LIS on ISS data to the GHRC, also emphasizing outreach with regard to the GHRC's lightning holdings. There was no mention of

LIS on ISS in the presentations, though the outreach aspect overlaps with Recommendation 3. While LIS on ISS is an upcoming mission, the UWG would like to see the GHRC be more proactive about future data holdings, and this is a prime example. To close the recommendation, the UWG would like to see this future dataset publicized and technical specifications of the data products and latency available to potential users before the start of the mission. This recommendation remains open.

Recommendation 12: Develop a single tool that can provide broad use to multiple field campaigns and data types.

The GHRC showed excellent progress in the development of their field campaign visual explorer and are working to develop APIs and data recipes that facilitate end user adoption of these tools and the underlying datasets. This work is on the right track, and the UWG recommends these efforts be continued. As the GHRC continues to build out these tools, the UWG sees the opportunity to develop advocates for these tools among science teams. Development of a user community can be spurred by focusing on documentation to support users in their use of the tool (including example code and recipes), and by providing a mechanism by which the GHRC might begin accepting user contributions (including bug reports, new algorithm contributions, examples, and refinements to documentation). The recommendation remains open.

Recommendation 13: Update the 'cite our data' webpage to include DOI in all the examples given and include a link to the 'cite our data' page on individual dataset information pages.

GHRC now highlights and encourages the use of DOI and, as requested, provides examples and links to the "cite our data" for all datasets. Thus, this recommendation has been successfully accommodated and is closed.

Recommendation 14: Communicate with the LPDAAC to understand their transition to HTTPS process. Provide highly visible examples, links to examples via email, and as much visibility as possible to ease the transition. A page with examples of different methods to download data, accompanied by example code, would be helpful.

GHRC is presently addressing the transition from FTP (including secure forms such as FTPS and SFTP) to a HTTPS process. Examples of the GHRC efforts to date were presented to the UWG. Since a transition to the HTTPS process is effectively being mandated by NASA IT for its higher inherent security, this effort would have been initiated even if a recommendation had not been made by the UWG. It may be valuable to provide information on GHRC web site to both help and encourage data customers to move from FTP to HTTPS. Providing the means to download small as well as large data sets by this method should be pursued. This recommendation remains open.

Recommendation 15: Look at netCDF4 as an internal data format, define common CF-compliant metadata for each data type, and develop tools that will check for metadata compliance.

GHRC is using netCDF as an internal format as much as possible. From 2014 to 2015, 33% more files were offered in netCDF4. The GHRC has been working with the HS3 science team to ensure conformance with netCDF/CF, and they evaluated NOAA netCDF templates to use as a guideline. GHRC investigated and found tools that will translate from HDF-EOS5 to netCDF. They found no need to develop CF-compliant tools as they are already developed and

available online. GHRC has made significant progress on this recommendation and it is now closed.

Recommendation 16: Explore and identify future users of possible mobile apps for NRT data. An assessment of how GHRC ingests format requirements could be used to broaden app utility.

The committee heard little about this topic but felt it could be delayed while GHRC worked on more immediate issues. The recommendation remains open.

2b. New Recommendations

The strength of the new mission and focus on hazardous weather is GHRC's ability to bring together diverse data sets needed to better understand the fundamental processes underlying these phenomena from satellite data, field experiment, and in-situ data. Even model data may be relevant in certain cases. Such one-stop shopping was viewed as incredibly powerful by the UWG. From this came a recommendation to demonstrate this capability as quickly as possible.

Recommendation 17: Create data bundles for scientists who want to study processes.

Demonstrate such bundling capabilities for review by the UWG.

As part of the new vision and mission, the GHRC would benefit greatly by having a really good visualization on its web page that connects the vision with the data holdings and the idea that data bundles are available for studying atmospheric processes.

Recommendation 18: Develop an attractive visualization that goes along with the new mission and vision statement that would help audiences associate the GHRC with its vision and mission statement.

Flood data from the SWOT mission (planned for launch around 2020) seems very appropriate for the GHRC data holdings. Given that satellite data archives are decided early in the mission definition process, the UWG is recommending that the GHRC pursue the land/flood part of the SWOT data for primary storage at GHRC. Data archives need to intuitively connect to users and having both lightning data and flood data begins to clearly connect GHRC to hazardous weather events.

Recommendation 19: Discuss the possibility of getting land data from the SWOT mission archived at GHRC to complement hazardous weather related to floods caused by excess precipitation. This would complement other flood and extreme event (including precipitation) data sets.

As a hazardous weather DAAC, and because of MSFC's tradition of holding lightning data, the GHRC is strongly encouraged to make GLM data from GOES-R available to their customers. The UWG is sensitive to the nature of the data and thus is silent on whether this involves data holdings, pointers to another archive, or a combination of these things.

Recommendation 20: GHRC should include GOES GLM data in its portfolio of accessible data, whether stored in house or as a virtual data set. Functionality should be seamless with other holdings.

3. Report on the utility of potential new data holdings

GHRC presented rationale and details about a number of potential new datasets to go along with its vision and mission. The UWG ranked the utility of these data sets as follows:

Highest importance data sets:

[GOES-R Lightning Cal Val data sets](#)
[Tropical Precipitation Feature Database](#)

High importance data sets:

[TRMM Precipitation Feature Database](#)
[TRMM Flood Maps](#)
[Surface based lightning data associated with Field Experiment holdings](#)
[NASA contributions to Vortex-Southeast field campaign](#)

Medium High importance data sets:

[Disaster response data](#)
[Crystal Face](#)
[Tropical Cyclone cold wake](#)

Low to medium importance data sets:

[The aerosol datasets](#)

4. UWG Structure

The UWG Chair was passed from Chelle Genteman to Christian Kummerow at the 2015 meeting. David Wolff will become the UWG Chair at the 2016 meeting. Between meetings Kummerow and Wolff will co-chair, with Kummerow having primary responsibility to finalize the 2015 report and Wolff having primary responsibility for next year's activities. Kummerow will formally step down as co-chair at the beginning of the 2016 meeting allowing a new co-chair to work with David Wolff. Jonathan Zawislak has tentatively agreed to serve as the new co-chair if possible.

The UWG members' expertise and terms of service are listed below. Four people (in red) are rotating off and need to be replaced. Nominations for new members are presented after the table of current members.

Lightning	Richard Blakeslee	2014	2	NASA MSFC
	Dennis Beuchler	2014	3	U. of AL Huntsville
	Eric Bruning	2014	4	Texas Tech
Passive Microwave	Chelle Gentemann	2014	2	Remote Sensing Systems
	Christian Kummerow	2014	4	Colorado State U.
	David Duncan	2014	3	Colorado State U.
Hurricane Science	Christopher Ruf	2014	2	U. of Michigan
	Jonathan Zawislak	2014	4	Florida International U.
	Sarah Bang	2014	2	U. of Utah
Global Precipitation	Walt Petersen	2014	4	NASA Wallops
Measurement Mission	David Wolff	2014	4	NASA Wallops
Severe Weather	Andrew Molthan	2014	3	NASA MSFC
	Chuntao Liu	2014	3	Texas A&M-CC

Applications	Rob Griffin	2014	3	U. of AL in Huntsville
	Kel Markert	2014	3	U. of AL in Huntsville

New member suggestions:

Deepak Mishra (U. of Georgia) – Application of remote sensing to inland and coastal environments – dmishra@uga.edu – <http://geography.uga.edu/directory/profile/mishra-deepak/>

Eric Anderson (NASA SERVIR) – Natural Hazards – eric.anderson@nsstc.uah.edu
<https://servirglobal.net/About-Servir/Our-Team/SERVIR-Coordination-Office-Team>

Pierre Kirstetter – U. of Oklahoma – Remote sensing of precipitation and extremes -
pierre.kirstetter@noaa.gov – <http://hydro.ou.edu/people/pierre-emmanuel-kirstetter/>

Wiebke Deierling – deierlin@ucar.edu – Lightning and natural hazards nowcast systems

Ian Giammanco – private sector – hurricanes, severe storms, and structural hazards assessment.
Has an active publication record – igiammanco@ibhs.org – http://disastersafety.org/staff_bios/.

Scott Rudlosky – Lightning – Scott.Rudlosky@noaa.gov –
http://www.star.nesdis.noaa.gov/star/Rudlosky_S.php

Steve Williams – NCAR data field campaign archive – sfw@ucar.edu –
<https://www.eol.ucar.edu/content/data-management-group-dmg>

Dan Cecil – NASA/MSFC – Field Experiments, Extreme Precipitation – daniel.j.cecil@nasa.gov
– https://airbornescience.nasa.gov/person/Daniel_Cecil

Tamlin Pavelesky – U. of North Carolina – Floods – pavelesky@unc.edu –
<http://www.unc.edu/~pavelesky/Pavelesky/Home.html>

Kyle Hilburn – (Until recently w. RSS) MW data and severe weather / storms –
kyle.hilburn@gmail.com – <https://www.linkedin.com/pub/kyle-hilburn/18/72a/a14>

Haiyan Jiang (Florida International University) - Hurricane Science, hajian@fiu.edu,
<http://tcpf.fiu.edu/Jiang/>

Chris Bedka, (NASA LaRC) – kristopher.m.bedka@nasa.gov – GEO/GOES-R satellite remote sensing and severe weather

General Comments

The idea of a GHRC project “scientist” or “science lead” was presented to the UWG. The UWG generally thought it helpful to have scientists that can represent the Center at scientific meeting

as well as providing quick feedback on new ideas. The UWG was ambivalent about whether a single person or tapping into multiple people would be of greater value and hence left that decision to GHRC management.

The UWG saw opportunities for the GHRC if it positioned itself as an organizer and conduit for disaster-related products. The Applied Sciences: Disasters program is finalizing an agency-wide response plan to coordinate efforts by Center-based and affiliated scientists in supporting science-based products in response efforts. Since disaster events require an ad hoc approach over a limited time period, GHRC's experience in the management of field campaign datasets might be appropriate. In addition, GHRC could bolster these Center efforts by including virtual holdings of other products relevant to the response activity (e.g. bringing in flood mapping or GPM precipitation through virtual holdings to go alongside hurricane-focused products generated or held at GHRC). Collaboration tools engineering experience may also provide sensible platforms for the sharing of products among scientists and end user.

GHRC may also benefit from having a two tiered structure for products with a second, less formal set of data holdings that could be described as exploratory to denote that it is PI based, and thus have few requirements for long term availability or reprocessing. This would allow GHRC to include new products in the hazardous weather area that may inform process studies, but are not officially supported. It may be worthwhile adding PI-led data sets, but there should be criteria for prioritizing which products to bring in—as someone accurately pointed out, the reward to the PI is a claim that their data is “archived” at a DAAC, with the implication that it is somehow more important/popular/etc. than others. There will need to be plausible criteria set so that the GHRC DAAC can treat all PIs fairly and avoid accusations of preference. It is also important to create a versioning plan to ensure that products will be updated with new data. This could include a mapping to NASA's “maturity” levels for data products. For example, it would not be very helpful if the DAAC had a “precipitation features” product provided by a given PI for, say, 2004-2007, and another product from another PI valid from 2007-2010, etc. Acquisition and maintenance of data products creates a “long bureaucratic tail” of effort, even at low effort levels, but these could accumulate quickly and become a budgetary burden in a flat budget profile. Another consideration would be to have PIs price in the participation of the GHRC DAAC to provide data management services for their products. For PI-led products that are derived from NASA data sets, GHRC should provide virtual holdings of the underlying data to provide continuity and linkage to other products and DAACs. For example, if there is a GPM-derived precipitation features database, it would be helpful for the GHRC DAAC to provide virtual holding links to the underlying GPM data back to Goddard or other sites.

In GHRC's pursuit of PI-led data sets of significant interest, it would seem that ground-based lightning networks would be a logical fit.

Appendix A

Comments on the Data Providers Questionnaire form. Comments are from Chuntao Liu, whose dataset was ranked high by the UWG for potential new datasets.

Step 1 of 4: Basic information of dataset

1. Provide a link to the “recommendations for the preparation of data file and documentation”
2. It is confusing to name everyone involved with the data. It would be sufficient to have one person/point of contact responsible for the data and one technical contact name, and maybe an affiliation or organization name.

Funding source and citation of the data could both be optional (considering the data are distributed before the official paper is out) and could be in the last category.

Step 2 of 4: Dataset description

1. A data set could be from multiple instruments. Options of adding multiple instruments should be there.
2. Spatial, temporal resolution of instrument should be on the next page

Data set description could include:

Name, short description, version and the algorithm date, source (ground, airborne, spaceborne, model, combinations, other), process level, a list of major physical parameters

Step 3 of 4: Temporal and spatial characteristics

Time period coverage and temporal resolutions are fine.

Data type could be more instructive (e.g. point, profiles, gridded averages, swath, time series, other). I am not sure what transect and polygon mean. This should be a multiple-choice pull down menu. Form could be interactive here and with different options for each data type.

PI of the data should provide all instruments information. Current input form is not quite appropriate, e.g., “radius of data collected from instrument”? Potential choices could include resolution, scanning geometry, parameter precision (optional), etc. for multiple instruments.

Step 4 of 4: Data preparation and delivery.

Upload option could also include “open a local file and upload the file by click a button”.

This section could include: data file formats; approximate volume; frequency to update the data; a sample reading code; publication for the data; funding support of the data.

Other:

I had issues not being able to go back to earlier page without losing the earlier input.

This website could be more interactive, such that a different data type may have a different information input options.